

REMARKS

In the present Amendment, Claim 16 has been added. Support is found, for example, on page 3, lines 2-4, of the present specification. No new matter has been added, and entry of the Amendment is respectfully requested. Upon entry of the Amendment, Claims 1-16 will be pending.

Claims 1-3, 5-13 and 15 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternatively, under 35 U.S.C. § 103(a) as obvious over Kasuga "Formation of titanium oxide nanotube," American Chemical Society (1998) (hereinafter "Kasuga I").

Applicants traverse and request the Examiner to reconsider and withdraw the rejection in view of the following remarks.

Claim 1 recites a titania nanotube having a length of 10 μm or more. The titania nanotube is produced by, for example, a method comprising dispersing a titania powder in a sodium hydroxide aqueous solution at a temperature of 60°C or more. See Claim 5. In this method, dispersing is advantageously conducted by stirring or irradiation with an ultrasonics. Specifically, dispersion is advantageously conducted by a method in which a titania powder and a sodium hydroxide aqueous solution are placed in a vessel with a stirrer, and the mixture in the vessel is stirred, or by a method in which a titania powder and a sodium hydroxide aqueous solution are mixed and the mixture is irradiated with an ultrasonics, or by a method combining them. See page 6, lines 13 to 21, of the specification. In other words, dispersing is not conducted in a static state.

Kasuga I relates to formation of titanium oxide nanotube.

The Examiner asserts that "Kasuga teaches a method of producing titania nanotube by dispersing nanometer size titanium dioxide in sodium hydroxide at temperature of 60 degrees C

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(Page 3161 Column 2). The resulting nanotubes have a diameter of 0.05 - 0.15 microns and an aspect ratio between 40 and 100 (Page 3160 Column 1).”

Applicants disagree with the Examiner’s characterization of the reference and reasoning in support of the rejection.

Kasuga I does not disclose that a titania powder is dispersed in a sodium hydroxide aqueous solution at a temperature of 60° C or more. Instead, Kasuga I discloses that “[f]ive milligrams of the powders was put into a Teflon vessel with 20 mL of NaOH aqueous solution with the concentration 2.5, 5, 10, or 20 M. The vessel was then placed in a stainless steel vessel, which was closed tightly, and held for 20 h at 20, 60, or 110° C.” See page 3161, column 2.

Further, Kasuga I states that “it was confirmed . . . that the TiO₂ nanotubes (anatase phase) with the diameter \approx 8 nm and the length \approx 100 nm are formed steadily by treatment with 10 M NaOH aqueous solution for 20 h at 110° C.” See page 3163 lines 4-8. The mark of \approx means “not more than.”

In addition, Kasuga I has not confirmed that TiO₂ nanotubes with a length of 100 nm or more were obtained. Applicants submit that the method disclosed in Kasuga I, which does not disclose the dispersing step, does not result in TiO₂ nanotubes with a length of 100 nm or more, as required by the claims.

Accordingly, Kasuga I as a whole does not teach or suggest a titania nanotube having a length of 10 μ m or more, and that Claim 1 is patentable over Kasuga I.

Withdrawal of the rejection is respectfully requested.

Claims 4 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kasuga “Formation of titanium oxide nanotube,” American Chemical Society (1998) (hereinafter

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“Kasuga II”), in view of Grimes, “A sentinel sensor network for hydrogen sensing,” Sensors (February 2003) (hereinafter “Grimes”).

Applicants submit that Kasuga II does not teach or suggest a titania nanotube having a length of 10 μm or more for the reasons discussed above with respect to Kasuga I, and that Grimes does not disclose a sensor having a length of 10 μm or more. Accordingly, Grimes does not make up for the deficiency of Kasuga II with respect to the length of the titania nanotube, and therefore, a *prima facie* case of obviousness has not been made because the cited references do not teach each and every limitation of Claims 4 and 14.

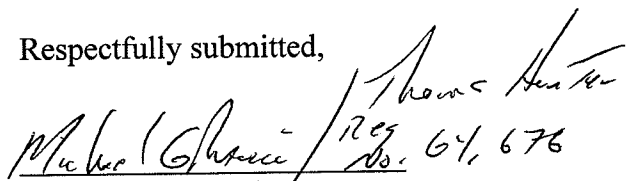
Withdrawal of the rejection is respectfully requested.

Claim 16 added herein is patentable at least based on its dependency on Claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The U.S. Patent and Trademark Office is hereby directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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